

How to Build a Wheelchair Patient Scale

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Abstract: The purpose of this project was to design and build a portable scale to weigh individuals in a wheelchair. Wheelchair users have a very difficult time weighing themselves. Most medical office and general consumer scales for adults are designed for persons who can stand unsupported. As a result, wheelchair users rarely know how much they weigh and have difficulty monitoring their weight. A portable scale was designed and constructed using two digital postal scales and materials from a local hardware store for approximately \$225. The scale was used to successfully weigh 204 patients at a series of nine community based spinal cord injury clinics held over a one year time period. The scale accurately weighed ambulatory patients weighing less than 100 pounds, medium weight patients in manual wheelchairs and a 200 pound patient in a 300 pound electric wheelchair. This wheelchair scale proved to be accurate, easily transportable and sturdy. As a result, wheelchair users knew their weight for the first time in years and were able to monitor their weight over the one year period.

Why this scale: I designed and built this scale to use at the community based spinal cord injury clinics referred to above. We had a commercial wheelchair scale but it proved to be too heavy, bulky and not long enough to weigh older model manual wheelchairs and some electric wheelchairs.

Scale availability: The wheelchair scale shown here uses two Sunbeam FreightMaster 400 (lbs.) electronic postal scales. Unfortunately, this particular scale is no longer in available. I purchased two reconditioned units at a Sunbeam outlet store but, due to corporate mergers, these outlet stores are now closed.



This durable wheelchair scale is easy to transport, set up, and use.

Where to buy scales: A similar electronic scale by Pelouze has a 400 lb. capacity and is carried by:

Staples, 1-800-333-3330, www.staples.com
Reliable Office Supplies, 1-800-735-4000, www.Reliable.com
Northern Tool & Equipment Co., 1-800-533-5545,
www.NorthernTool.com

Price of the Pelouze scale is under \$150.00.

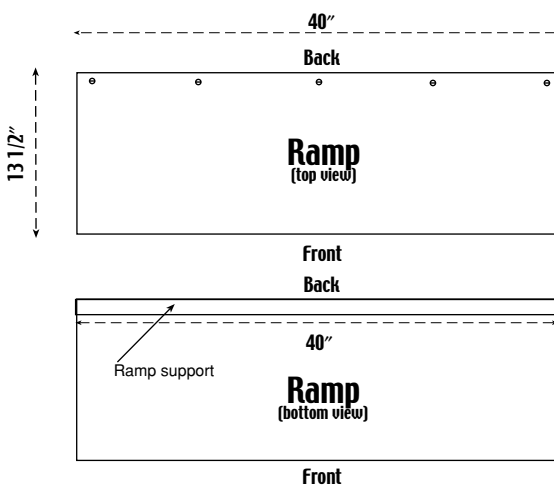
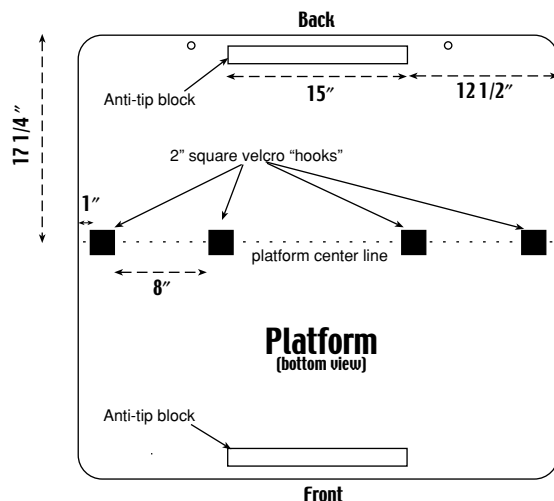
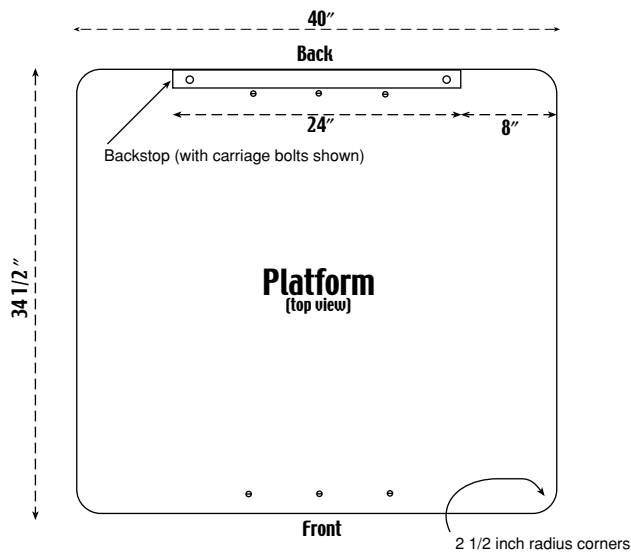
The FreightMaster 400 scale was manufactured by **Siltec**. This company is still in business and offers a variety of other scales which are suitable for the wheelchair scale. The Siltec 500L is the same size as the "400" shown here but will weigh up to 500 lbs. which will give your wheelchair scale a capacity of 1000 lbs. Price of the 500L is \$185.

Also check your local yellow pages under "mailing equipment." Look for digital shipping scales. Search the internet; here are two sites to start with:

Scales Galore, www.scalesgalore.com
Value Scale, www.valuescale.com.

If you find a good economical source for a suitable scale that you would like to share, contact me and I will post it on our home page: www.state.ar.us/ascc

Wheelchair Patient Scale Drawings, Components and Notes

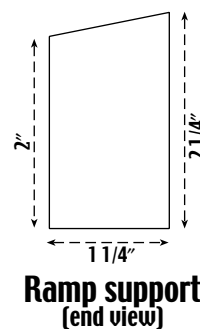


Notes: This wheelchair scale works! Learn by building this one before making alterations! I welcome improvements; please send me your suggestions.

The height of the electronic scale will determine the height of the ramp support. Build ramp and platform from lumber of the same thickness and height of ramp and platform will match. Wood glue on the ramp support joint is optional. Since the electronic scale is 12" wide and the velcro pieces are 2" square, there is 8" between the velcro squares which matches the platform bottom. Note alignment of velcro squares on electronic scale with cord on side of the platform (below and Photo 1). Non-slip drawer liner is made by Popular Mechanics and was purchased at Wal-Mart in the tool department. Screws used in the platform were brass colored just because they looked nice with the clear finish. Have fun with this project!



2" square velcro "loops"



Ramp/ramp support joint.

Materials List - Wheelchair Scale

Wood Finished Dimensions in Inches

Platform	3/4 x 34 1/2 x 40
Ramp	3/4 x 13 1/2 x 40
Backstop	3/4 x 1 1/2 x 24
Anti-tip block (2)	1 1/2 x 1 1/2 x 15
Ramp support	1 1/4 x 2 1/4 x 40

Hardware

- #6 x 1 1/2" Flathead wood screws (6)
- #6 x 1 1/2" Flathead wood screws (5)
- 1/4" x 2" Carriage bolt, flat washer and nut (2)
- 2" x 2" heavy duty velcro material, adhesive back, hook and loop set (4)
- 16 3/4" x 40" non-slip drawer liner (2)

Finish

Clear, satin polyurethane, one quart

Tools

- 3/8" Drill with screw driver bit
- 1/8" Drill bit
- Saber saw / router
- Table saw / skill saw
- Compass or arc jig
- Sand paper, medium and coarse
- 2" brush
- Eye protection

Scale

- Sunbeam FreightMaster 400 electronic (2)
- AA alkaline batteries (12)

Cost (approximately)

Platform and ramp	\$40.00
Backstop	2.00
Anti-tip block (2)	2.00
Ramp support	2.00
#6 x 1 1/2" FH wood screws (12)	2.00
Heavy duty velcro	3.00
Polyurethane, quart	8.00
Drawer liner	8.00
Sandpaper	2.00
Scale, reconditioned (2)	150.00
AA alkaline batteries (12)	6.00
Total	\$225.00

Wheelchair Scale Construction

(Read all instructions and the Notes section before purchasing any materials.)

The platform and ramp are cut from a half sheet (4' x 4') of 5-ply birch veneer plywood. Any finish grade hardwood can be used for the backstop. The ramp support and anti-tip blocks can be made of construction grade pine.

Start by cutting the parts to the size indicated in the materials list. The platform and ramp can be cut to size for you by your lumber store if you prefer. A table saw or skill saw will be needed to cut the ramp support to the angle indicated. Observe safety rules and wear eye protection!

Round the corners of the platform to a 2 1/2" radius with a compass. If you don't have a compass then use something round that is about 5 inches in diameter like a large container lid. Align the lid to the corner sides and mark. Cut the corners round using a saber saw or router. Sand the corners and the top of the platform and ramp smooth. Wipe off dust with a clean damp rag. Let dry completely. Apply three coats of polyurethane to all sides of the platform and ramp according to the manufacturer's directions. Let dry completely between coats.

Select the best looking platform side as the top and the other side as the bottom. Attach the anti-tip blocks to the bottom of the platform using #6 x 1 1/2" flathead wood screws. Position the anti-tip blocks 1" from the back and front of the platform. Drill pilot holes for the screws from the platform top using a 1/8" drill bit. Pilot holes will be 1 3/4" from the platform back and front. It's not necessary to drill pilot holes in the anti-tip block.

Select the best looking ramp side as the top and the other side as the bottom. Attach the ramp support to the bottom of the ramp using #6 x 1 1/2" flathead wood screws. Position the ramp support along the back of the ramp bottom. Drill pilot holes for the screws from the ramp top using a 1/8" drill bit. Pilot holes will be 3/4" from the ramp back. It's not necessary to drill pilot holes in the ramp support.

Apply three coats of polyurethane to all sides of the backstop according to the manufacturer's directions. Let dry completely between coats. Drill a 1/4" hole, centered, 2" from each end of the backstop. Center the backstop along the back edge of the platform top. With a pencil, mark drilling locations on the platform top using the holes in the backstop. Drill the two 1/4" holes from the platform top. Attach the backstop to the platform top using the carriage bolts. Washers and nuts go on the platform bottom side.

On the platform bottom attach the velcro "hooks" as indicated in the drawing along the platform center line. Attach the velcro "loops" on either end of the scale top (see photo).

Cut two 40" lengths of the non-slip drawer liner.

The scale is now ready to be assembled and used.

Wheelchair Patient Scale Setup and Use



Photo 1 - Select a location at least two feet from a wall. Stretch out mat and place scales at either end.



Photo 2 - Place the platform on the scales, matching up the velcro squares to those on the platform.



Photo 3 - Stretch out the second mat in front of the platform and place the ramp on top of it.



Photo 4 - Turn on both of the scales. You did put batteries in the electronic scale, didn't you?



Photo 5 - Push patient in wheelchair up the ramp and onto the center of the platform. The wheels should be in the center of the platform with the casters against the backstop. Note that the foot rests and patient's feet extend beyond the platform. Avoid hitting the feet against the wall to prevent bruising and possible pressure sores. Move scale away from wall if necessary.



Photo 6 - Lock the wheels and tell patient to sit still. Read the display of both scales and add together. For example, $82 + 79 = 161$. This is the weight of the patient and wheelchair.



Photo 7 - Unlock and back the chair down ramp. Transfer patient out of chair and weigh just the wheelchair. Subtract the chair weight from the first figure to determine the weight of the patient. For example, $161 - 28 = 133$.